We retina, trigger nerve impulses in the ganglion

We would discuss afferent codes for:

(a) Afferent Code for Hue:

The retinas of monkeys, apes and human beings contain three types or classes of cones. One type absorb light best in the long-wave-length (yellow) region of the spectrum, a second class of cones absorbs best in the middle-wave-length (green) part of the spectrum and the third type absorbs short wavelengths (blues) most readily. Because the afferent coding of colour starts with these three different cone types, this aspect of colour coding is said to be due to a trichromatic (“ three”) process. The cone receptor potentials by light absorption, after crossing the intermediate layers of the retina, trigger nerve impulses in the ganglion cells of the retina, the ganglion cells, the lateral geniculate cells of the thalamus with which the ganglion cells connect, and many cells of the visual cortex code for colour by what is called as an apparent-process mechanism. This means that the ganglion colour- coding cells and others in the brain arc excited by wavelengths in one part of the spectrum and inhibited by wavelength in another part. .

(b) Afferent Codes for Brightness and Saturation:

Activity patterns in what are called opponent cells are said to be involved in the afferent code for brightness.

The afferent code for saturation may depend on the relative amounts of activity in opponent and non-opponent cells.

(c) Afferent Codes for Form in Vision:

Our knowledge about afferent codes for form is limited. Researchers have found that the retina and brain use differences in light energy to generate patterns of nerve-cell activity which represent, or stand for, the forms that we see. In some animals, the activity recorded from single optic-nerve fibres shows that a great deal of analysis of form occurs in the retina itself. For instance, recordings from the optic-nerve fibres of the frog have found cells that preferentially respond to various shape features of stimuli. Thus, in frog some optic-nerve fibres respond most readily when small, round shapes are presented to the eye, these same fibres do not respond so vigorously to other shapes. In higher animals, form vision depends, to a large degree but perhaps not exclusively on the activity of nerve cells in the parts of the cereberal cortex that process visual point. Researchers have measured and classified the activity patterns occurring in these cells and have hypothesised how the patterns might be related to form vision.

One hypothesis about cortical nerve cell activity and form vision stems from the observation that most nerve cells in the visual cortex respond best to lines, edges or bars of light presented to the eye, other types of stimuli are less effective. Another hypothesis about from vision is based on the observation that groups of cells in the visual cortex respond best to certain spatial frequencies of visual stimulation.